

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

CM2192

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

10/088574

INTERNATIONAL APPLICATION NO.  
PCT/US00/25685INTERNATIONAL FILING DATE  
20 September 2000PRIORITY DATE CLAIMED  
20 September 1999

## TITLE OF INVENTION

Treatment Compositions For Fabrics

## APPLICANT(S) FOR DO/EO/US

BETTIOL, Jean-Luc Philippe et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(l).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application was filed (35 U.S.C. 371(c)(2))
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ has been transmitted by the International Bureau.
  - c. ☒ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.  
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☒ A change of power of attorney and/or address letter.
16. ☐ Other items or information:

"Express Mail" mailing label number

Date of Deposit

I hereby certify that this paper/fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to The Assistant Commissioner of Patents, Washington, D.C. 20231

Administrator Mailing Application

Signature

U.S. APPLICATION NO. <b>10/088574</b> <small>(37 CFR 1.53)</small>		INTERNATIONAL APPLICATION NO. PCT/US00/25685		ATTORNEY'S DOCKET NUMBER CM2192	
				CALCULATIONS      PTO USE ONLY	
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>				<b>\$740</b>	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				<b>\$0</b>	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	20-20 =	0	x \$18.00	<b>\$0</b>	
Independent Claims	3-3 =	0	x \$84.00	<b>\$0</b>	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			\$280.00	<b>\$0</b>	
<b>TOTAL OF ABOVE CALCULATIONS =</b>				<b>\$740</b>	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				<b>\$0</b>	
<b>TOTAL NATIONAL FEE =</b>				<b>\$740</b>	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28,3.31). \$40.00 per property +				<b>\$0</b>	
<b>TOTAL FEES ENCLOSED =</b>				<b>\$740</b>	
				Amount to be refunded	\$
				charged	\$
<p>a. <input type="checkbox"/> A check in the amount of \$ ____ to cover the above fees is enclosed.</p> <p>b. <input checked="" type="checkbox"/> Please charge my Deposit Account No. <u>16-2480</u> in the amount of \$ <u>740</u> to cover the above fees.          A duplicate copy of this sheet is enclosed.</p> <p>c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or          credit any overpayment to Deposit Account No. <u>16-2480</u>. A duplicate copy of this sheet is          enclosed.</p> <p><b>NOTE:</b> Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive          (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p> <p><b>SEND ALL CORRESPONDENCE TO:</b></p>					
<b>J. A. Glazer, Patent Attorney</b> <b>Customer Number 27752</b>				<div style="text-align: center;"> </div> <div style="text-align: center;">             Signature  <hr style="width: 100%;"/> </div> <div style="text-align: center;">             T. David Reed              Name  <hr style="width: 100%;"/> </div> <div style="text-align: center;">             32,931              Registration Number  <hr style="width: 100%;"/> </div>	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Case CM2192

In the Matter of: :  
U.S. National Phase Entry :  
under 35 U.S.C. §371 from :  
International Application of : Group Art Unit: N/A  
Jean-Luc Philippe Bettiol et al. : Examiner: N/A  
International Application No.: :  
PCT/US00/25685 :  
Filed: September 20, 2000 :  
For: Treatment Compositions for Fabrics

PRELIMINARY AMENDMENT

Assistant Commissioner of Patents  
Washington, D.C. 20231

Dear Sir:

Before computing the fees for entering the above-identified International Application into the U.S. National Phase, please enter the following amendments:

IN THE CLAIMS:

Please delete current claims 1A - 14A and replace with the new claims 15 - 34 below.

15. A fabric treatment composition comprising a suds suppressing system, said composition having a clarity value upon 0.2% dilution of less than that of a 0.04% by weight of an aqueous solution of dimethyl bis(steroyl oxyethyl) ammonium chloride and further having a suds reduction value of at least about 50%.
16. A composition according to Claim 15 wherein the composition has an acidic pH.
17. A composition according to Claim 15 wherein the suds suppressing system is selected from the group consisting of silicone antifoam compounds, alcohol antifoam compounds, fatty acids, paraffin antifoam compounds, poloxamer, polypropyleneglycol, dimethicone, tallow derivatives, light petroleum odorless hydrocarbons, fatty esters, fatty acid esters of monovalent alcohols, aliphatic C<sub>18</sub>-C<sub>40</sub> ketones, N-alkylated amino triazines, bis stearic acid amide, monostearyl phosphates, phosphate esters, quaternary ammonium compounds, di-alkyl quaternary compounds, poly fictionalized quaternary compounds, and nonionic polyhydroxyl derivatives, and mixtures thereof.

18. A composition according to Claim 15 wherein the composition further comprises a stabilizing agent.
19. A composition according to Claim 18 wherein the stabilizing agent is selected from the group consisting of xanthan gum or derivatives thereof, alginate or derivatives thereof, ethoxylated cellulose, carboxymethylcellulose, hydroxymethylcellulose, hydroxypropyl cellulose, hydroxyethyl cellulose and mixtures of said stabilizing agents.
20. A composition according to Claim 15 wherein the composition further comprises an antibacterial agent.
21. A composition according to Claim 15 wherein the composition further comprises a buffering system.
22. A composition according to Claim 21 wherein the buffering system comprises material selected from the group consisting of alkali metal salts of carbonates, polycarbonates, sesquicarbonates, silicates, polysilicates, borates, metaborates, phosphates, polyphosphates, aluminates, and mixtures of said materials.
23. A composition according to Claim 15 wherein the composition further comprises a crystal growth inhibitor.
24. A composition according to Claim 23 wherein the crystal growth inhibitor is selected from the group consisting of carboxylic compounds, organic diphosphonic acids, organic monophosphonic acids, and mixtures of said crystal growth inhibitors.
25. A composition according to Claim 15 wherein the composition further comprises a heavy metal ion sequestrant.
26. A composition according to Claim 25 wherein the heavy metal ion sequestrant is selected from the group consisting of organo aminophosphonates, nitrilotriacetic acid, polyaminocarboxylic acid, iminodiacetic acid, and mixtures of said sequestrants.
27. A composition according to Claim 15 wherein the composition further comprises a hydrophobic dispersant.
28. A method of rinsing fabrics which have been previously contacted with an aqueous detergent liquor, said method comprising the steps of:
  - (a) contacting said fabrics with a fabric treatment composition wherein said composition comprises a suds suppressing system, said composition having a clarity value upon 0.2% dilution of less than that of a 0.04% by weight of an aqueous solution of dimethyl bis(steroyl

oxyethyl) ammonium chloride and further having a suds reduction value of at least about 50%;  
and

(b) rinsing said fabrics with water.

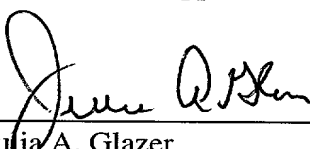
29. A method of pre-treating fabrics, said method comprising the steps of:
- (a) contacting said fabrics with a fabric treatment composition wherein said composition comprises a suds suppressing system, said composition having a clarity value upon 0.2% dilution of less than that of a 0.04% by weight of an aqueous solution of dimethyl bis(steroyl oxyethyl) ammonium chloride and further having a suds reduction value of at least about 50%; and wherein said composition is in its neat form; and
  - (b) rinsing said fabrics.
30. The method of Claim 29 further comprising the step of washing said fabrics after said step of contacting said fabrics and before said step of rinsing said fabrics.
31. The method of Claim 29 further comprising the step of soaking said fabrics before said step of washing said fabrics.
32. The method of Claim 30 further comprising the step of soaking said fabrics before said step of washing said fabrics.
33. The method of Claim 28 wherein said method is carried out by hand.
34. The method of Claim 29 wherein said method is carried out by hand.

#### **SUMMARY**

Support for these amendments is found in the claims as originally filed. These amendments are entered to bring the claims into conformance with 37 CFR §1.75. No new matter is added.

Respectfully submitted,

FOR: Jean-Luc Philippe Bettiol et al.

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March 19, 2002

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TREATMENT COMPOSITIONS FOR FABRICS

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Technical Field

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The present invention relates to treatment composition for fabrics, in particular the hand rinsing of fabrics as well as the rinsing of fabrics in top loaded non automatic washing machines which have been laundered with a detergent composition, especially a high suds composition.

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Background of the Invention

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Nowadays, the trends for washing is by using a washing machine whereby the laundry detergent and the softening composition are dispensed from the washing machine via two separate compartments, thereby ensuring the automated release of the detergent at the beginning of the washing process and the release of the softening composition in the rinse process, usually the last rinse process.

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In most countries under development, the consumer's washing habit is to wash their garments with either a non automatic top loaded washing machines (i.e

apparatus which comprises two separated cubicles, one for washing or rinsing, and one for spinning), or basins or bucket. The washing in basins or buckets involves a manually operated process with the multiple cumbersome steps of damping the fabrics, washing with detergent, wringing, and rinsing thoroughly.

5 Similarly, the washing in non automatic top loaded washing machines, the washing is operated by placing the fabric with detergent in the cubicle containing water and agitation, removing the fabrics from the cubicle containing the detergent liquor, placing the fabric in the spinning cubicle for spinning step, empty the detergent liquor from the other cubicle and replace it by fresh water and then  
10 put back the spinned fabrics for rinsing, the rinsing step of spinning, rinsing, and spinning being often reiterated several time to obtain acceptable rinsed fabrics.

Accordingly, there is a need for processes or composition that will relieve or ease the burden of the washing on the consumer.

15 Further, the hand-washing treatment of fabric, in general, is not constrained to any particular geographical region. Although certain areas having limited access to modern appliances have a higher prevalence of laundering treatment by hand, the need to hand-wash, including rinsing, at least certain items of clothing appears universal. Hence, even with modern washing machine having the rinsing  
20 step, there are still many garments, especially those manufactured from "fine fabric" material (i.e. silk) or those which comprise "soft woven" material (i.e. woolen knitted sweaters) are commonly "laundered by hand", for example, "delicate" or "personal" items typically require hand-washing. Hand laundering  
25 treatment typically limits the temperature at which the fabric is washed, usually within a range tolerable to the person washing the garment.

In addition, a unique aspect of washing-by-hand, and/or washing in non automatic top loaded washing machine, is the high detergent to water ratio and/or  
30 the high soil to water ratio (high soil loading). Indeed, fabric treated with such detergent usually become saturated with residual detergent and/or dirt and particulate matter upon transfer to the rinse step. Compared to modern (automatic) washing machines, this problem of saturation is even more acute with manual washing and/or washing in non automatic top loaded washing machine,  
35 as it is due to the poor efficiency of the spinning and/or wringing in between the wash and the rinse steps.

Conventional detergent products which are currently used for the hand laundering and/or top loading non automatic washing machine treatments are the so called "High Suds Detergents". One commonly known feature of these detergent products is that a significant amount of suds appears on top of the wash solution upon agitation. However, a problem encountered by the consumer is that the suds is also carried over to the rinse step and often its formation still arises, thereby requiring cumbersome removal by successive rinsing and spinning/wringing with water. Consequently, the hand rinsing of fabric and its drawback of excessive foam is something consumers are familiar with.

Conventional rinsing step involves the step of contacting the laundered fabric with water so as to remove the soiled laundry liquor but the suds as well.

Therefore, there is still a need for an effective rinsing composition for use in the hand treatment of fabrics.

Still, there is a further need for a rinsing composition which provide softness to the treated fabrics.

One way to achieve this is by using a conventional fabric softener. Indeed, the use of fabric softener actives such as the current quaternary ammonium compound provides a noticeable reduction of the suds. However, quaternary ammonium compounds are by nature water-insoluble compounds, thereby giving a turbid composition upon dilution, which as a result produce a turbid rinse. Moreover, current fabric conditioner actives may interact with the residual surfactant like the anionic surfactants, present on the laundered fabric. As a result, the formation of poorly soluble material so called scums arises floating on top of the rinse solution. It is speculated that the presence of scums arises from the water-insolubility property of the quaternary ammonium softener compound and/or the interaction from the anionic detergent liquor which is present on the fabric with the quaternary ammonium softener compound from the softening composition.

Accordingly, the clarity of the rinse water is an important factor for the consumer. Indeed, it is often perceived by the consumers as a signal of a thoroughly



completed rinse. In other words, the more turbid the rinse water is, the more rinses are performed by the consumer, i.e. until a clear rinse solution is obtained. In the end, more water than is necessary is used to complete the rinse, particularly when a significant amount of residual detergent and soil are carried  
5 over the wash steps.

Accordingly, there is a need for a rinse aid which will reduce the suds and which will provide a clear rinse solution

10 It has now been surprisingly found that a fabric rinse treatment composition that has a clarity value upon dilution of less than a 0.04 % by weight of a dimethyl bis(steroyl oxyethyl) ammonium chloride aqueous solution and a suds reduction value of at least about 50% fulfill such a need.

15 In a preferred embodiment of the invention composition, it has been found that the invention composition gives a reduced re-soiling of the fabrics during the rinsing steps. The re-soiling is believed to arise from the excess of soil which is carried over from the wash to the rinse steps and/or of the use of water contaminated with heavy metal ion.

20 The use of this composition has also been found effective in the pre-treatment or soaking of fabric to improve the cleaning end result benefits of the wash process. Not to be bound by theory, it is believed that the mechanism behind the improved cleaning benefit lies in the composition weakening the link between the residual  
25 soil present on the fabric and the cellulose fabric fiber, thereby enabling an easier removal in the subsequent wash process.

This additional advantage of the invention composition is particularly beneficial when water contaminated with heavy metal ions is used. Indeed, water  
30 contaminated with heavy metal ions is often the cause of re-soiling on fabrics upon treatment. Accordingly, it is an advantage of the invention to provide a pre-treatment composition and/or soaking composition which reduces or even prevents the resoiling of the fabric.

Moreover, it has also been found that the use of the composition in both pre-treatment and/or soaking step and rinsing step allows an even better cleaning performance.

### Summary of the Invention

There is provided a fabric treatment composition comprising a suds suppressing system, characterised in that the composition which has a clarity value upon a 0.2% dilution of less than a 0.04% by weight of a dimethyl bis(steroyl oxyethyl) ammonium chloride aqueous solution and a suds reduction value of at least about 50%.

In another aspect of the invention, there is provided a method for rinsing fabrics which comprises the steps of contacting the fabrics, previously contacted with an aqueous detergent liquor, with a composition of the invention.

Still, in another aspect of the invention, there is provided a method for pre-treating the fabrics which comprises the steps of applying in neat form the composition to the fabrics, and subsequently rinse or wash and rinse it.

In a further aspect of the invention, there is provided a method for soaking the fabrics which comprises the step of contacting the fabrics with a composition of the invention, in its diluted form, before the fabrics are rinsed or washed and rinsed.

### Detailed Description of the Invention

One essential feature of the invention composition is that the composition has a clarity value upon a 0.2% dilution of less than a 0.04% by weight of a dimethyl bis(steroyl oxyethyl) ammonium chloride aqueous solution.

#### **Clarity Test Method**

### The clarity

of the treatment composition is one essential feature of the invention. Clarity is defined according to the following test method:

- 5 Firstly, a reference composition is made containing 0.04% by weight of a C11-C22 diakylester quaternary ammonium compound, in particular, the dimethyl bis(steroyl oxyethyl) ammonium chloride, in deionised water at 70°C. The solution is vigorously stirred until full dispersion of the quaternary ammonium is achieved. The solution is then cooled down to room temperature.

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The test composition is then prepared by dilution of the composition to obtain a 0.2% diluted composition, using deionised water at the temperature required to solubilize or disperse all the actives.

- 15 The two compositions are subsequently evaluated for their clarity properties using a KONTRON Instrument Uvikon 933 set up on the following parameters:

Wavelength range (nm) 350-700

Scan Speed (nm/min) 500

Data Interval (nm) 1.0

- 20 Cycles (min) 1\*00

Lamp change (nm) 340

Bandwith (nm) 2.0

- 25 Tested composition at 0.2% which have an intensity below or equal to that of the reference composition at 0.04% are suitable for the present invention provided they also meet the suds suppressing Test.

### Suds Reduction Test Method

- 30 The suds reduction property of the hand treatment is another essential feature of the invention. Suds reduction is defined according to the following test method:

- 35 2 beakers of 1 liter are prepared containing each 750ml of a C<sub>11</sub>-C<sub>18</sub> alkyl benzene sulfonates (LAS) solution at 0.02% using city water at room temperature and 12gpg hardness. The two solutions are closed hermetically and agitated vigorously during 15 seconds to generate about 3 cm of foam on top of the solutions.

In the first beaker, nothing is added and it serves as a reference, whereas to the second beaker is added 3ml of the composition to be tested. The foamed solutions in both beaker are then manually stirred for about 1 minute at the rate of 100 rpm (with a 20cm long, 0.5cm plastic spatula).

The remaining presence of foam is assessed visually. The foam in the reference beaker remains at about 3cm. Suitable compositions are those that have a suds reduction over the reference of about at least 50%, preferably of at least 80% and most preferably of at least 99%. 99% is where all the foam disappeared apart from the optional presence of a white film that may partially cover the surface of the solution.

#### Suds suppressing system

In a preferred embodiment of the invention, the reduction of the suds is achieved by use of a suds suppressing system. The suds suppressing system is preferably present at a level of from 0.01% to 99%, more preferably from 0.05% to 50%, most preferably from 0.1% to 5% by weight of the composition. Such suds suppressing systems are even more desired components of the compositions of the invention when the detergent liquor is made of detergent which comprises a surfactant system that comprises high foaming surfactant, such as the conventional C<sub>11</sub>-C<sub>18</sub> alkyl benzene sulfonates ("LAS").

A wide variety of materials may be used as suds suppressors, and suds suppressors are well known to those skilled in the art. See, for example, Kirk Othmer Encyclopedia of Chemical Technology, Third Edition, Volume 7, pages 430-447 (John Wiley & Sons, Inc., 1979).

Suitable suds suppressing systems for use herein may comprise essentially any known antifoam compound, including, for example silicone antifoam compounds, alcohol antifoam compounds like 2-alkyl alcanol antifoam compounds, fatty acids, and paraffin antifoam compounds, and mixtures thereof.

By antifoam compound it is meant herein any compound or mixtures of compounds which act such as to depress the foaming or sudsing produced by a

solution of a detergent composition, particularly in the presence of agitation of that solution.

Particularly preferred antifoam compounds for use herein are silicone antifoam compounds defined herein as any antifoam compound including a silicone component. Such silicone antifoam compounds also typically contain a silica component. The term "silicone" as used herein, and in general throughout the industry, encompasses a variety of relatively high molecular weight polymers containing siloxane units and hydrocarbyl group of various types like the polyorganosiloxane oils, such as polydimethyl-siloxane, dispersions or emulsions of polyorganosiloxane oils or resins, and combinations of polyorganosiloxane with silica particles wherein the polyorganosiloxane is chemisorbed or fused onto the silica. Silicone suds suppressors are well known in the art and are, for example, disclosed in U.S. Patent 4,265,779, issued May 5, 1981 to Gandolfo et al and European Patent Application No. 89307851.9, published February 7, 1990, by Starch, M. S. Other silicone suds suppressors are disclosed in U.S. Patent 3,455,839 which relates to compositions and processes for defoaming aqueous solutions by incorporating therein small amounts of polydimethylsiloxane fluids. Mixtures of silicone and silanated silica are described, for instance, in German Patent Application DOS 2,124,526. Silicone defoamers and suds controlling agents in granular detergent compositions are disclosed in U.S. Patent 3,933,672, Bartolotta et al, and in U.S. Patent 4,652,392, Baginski et al, issued March 24, 1987.

Examples of suitable silicone antifoam compounds are the combinations of polyorganosiloxane with silica particles commercially available under the tradename DC 2-3565 or DC 2-3000 from Dow Corning.

Other suitable antifoam compounds include the monocarboxylic fatty acids and soluble salts thereof. These materials are described in US Patent 2,954,347, issued September 27, 1960 to Wayne St. John. The monocarboxylic fatty acids, and salts thereof, for use as suds suppressing system typically have hydrocarbyl chains of 10 to about 24 carbon atoms, preferably 12 to 18 carbon atoms like the tallow amphopolycarboxyglycinate commercially available under the tradename TAPAC. Suitable salts include the alkali metal salts such as sodium, potassium, and lithium salts, and ammonium and alkanolammonium salts.

Other suitable antifoam compounds include, for example, high molecular weight hydrocarbons such as paraffin, light petroleum odorless hydrocarbons, fatty esters (e.g. fatty acid triglycerides, glyceryl derivatives, polysorbates), fatty acid esters of monovalent alcohols, aliphatic C<sub>18</sub>-C<sub>40</sub> ketones (e.g. stearone) N-alkylated amino triazines such as tri- to hexa-alkylmelamines or di- to tetraalkyldiamine chlortriazines formed as products of cyanuric chloride with two or three moles of a primary or secondary amine containing 1 to 24 carbon atoms, propylene oxide, bis stearic acid amide and monostearyl phosphates such as monostearyl alcohol phosphate ester and monostearyl di-alkali metal (e.g., K, Na, and Li) phosphates and phosphate esters, quaternary ammonium compounds, dialkyl quaternary compounds, poly functionalised quaternary compounds, and nonionic polyhydroxyl derivatives. The hydrocarbons, such as paraffin and haloparaffin, can be utilized in liquid form. The liquid hydrocarbons will be liquid at room temperature and atmospheric pressure, and will have a pour point in the range of about -40°C and about 5°C, and a minimum boiling point not less than 110°C (atmospheric pressure). It is also known to utilize waxy hydrocarbons, preferably having a melting point below about 100°C. Hydrocarbon suds suppressors are described, for example, in U.S. Patent 4,265,779, issued May 5, 1981 to Gandolfo et al. The hydrocarbons, thus, include aliphatic, alicyclic, aromatic, and heterocyclic saturated or unsaturated hydrocarbons having from about 12 to about 70 carbon atoms. The term "paraffin", as used in this suds suppressor discussion, is intended to include mixtures of true paraffins and cyclic hydrocarbons.

Copolymers of ethylene oxide and propylene oxide, particularly the mixed ethoxylated/propoxylated fatty alcohols with an alkyl chain length of from 10 to 16 carbon atoms, a degree of ethoxylation of from 3 to 30 and a degree of propoxylation of from 1 to 10, are also suitable antifoam compounds for use herein.

Other suds suppressors useful herein comprise the secondary alcohols (e.g., 2-alkyl alkanols as described in DE 40 21 265) and mixtures of such alcohols with silicone oils, such as the silicones disclosed in U.S. 4,798,679, 4,075,118 and EP 150,872. The secondary alcohols include the C<sub>6</sub>-C<sub>16</sub> alkyl alcohols having a C<sub>1</sub>-C<sub>16</sub> chain like the 2-Hexyldecanol commercially available under the tradename ISOFOL16, 2-Octyldodecanol commercially available under the tradename

ISOFOL20, and 2-butyl octanol, which is available under the trademark ISOFOL 12 from Condea. A preferred alcohol is 2-butyl octanol, which is available from Condea under the trademark ISOFOL 12. Mixtures of secondary alcohols are available under the trademark ISALCHEM 123 from Enichem. Mixed suds suppressors typically comprise mixtures of alcohol : silicone at a weight ratio of 1:5 to 5:1.

Other suitable antifoams, described in the literature such as in Hand Book of food additives, ISBN 0-566-07592-X, p804, are selected from dimethicone, poloxamer, polypropyleneglycol, tallow derivatives, and mixtures thereof.

To secure optimum rinse solution clarity with very limited residual materials on the surface of the rinse solution, it is preferred that the composition is substantially free (i.e. less than 1.5% by weight of the composition) and preferably free of quaternary ammonium compounds having di-long chain such as ditallow dimethyl ammonium chloride (DTDMAC), C11-C22 diakylester quaternary ammonium compound, in particular, the dimethyl bis(steroyl oxyethyl) ammonium chloride or the 1,2-di(tallowyloxy-oxo)-3-N,N,N-trimethylammoniopropane chloride, so that the clarity rinse solution is not affected. Indeed, although they have effective suds suppressing properties, their water-insoluble properties renders the solution cloudy, and even turbid.

Preferred among the suds suppressing systems described above are the silicone antifoam, in particular the the combinations of polyorganosiloxane with silica particles.

#### pH of the composition

In a highly preferred aspect of the invention the compositions according to the invention have a pH as a 0.2% solution in distilled water at 20°C of less than 7, preferably from 3 to 6.5, most preferably from 4 to 6.5. The use of this acid pH range is desirable for the invention compositions as it enables the rejuvenation of the smoothness of the fabric as well as a stain removal performance, in particular of bleachable stains.

The pH of the compositions may be adjusted by the use of various pH acidification agents. Preferred acidification agents include inorganic and organic

acids including, for example, carboxylate acids, such as citric and succinic acids, polycarboxylate acids, such as polyacrylic acid, and also acetic acid, boric acid, malonic acid, adipic acid, fumaric acid, lactic acid, glycolic acid, tartaric acid, tartronic acid, maleic acid, their derivatives and any mixtures of the foregoing.

- 5 Citric acid is a useful pH acidification agent herein. A highly preferred acidification acid is citric acid which has the advantage of providing a rejuvenation of the natural smoothness of the fabric. A typical amount of acidifying agent is of from 0.1% to 50%, preferably from 0.5 to 10% by weight of the composition.

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#### pH buffering component

- In order to maintain the acid pH range upon dilution of the composition in the pre-treatment and soaking treatment and/or post-treatment like rinse process, it is beneficial to have a pH buffering agent. The problem of pH sustain is even more  
15 acute in post-treatment mode like the rinse process as the laundered fabrics which need to be rinsed off are impregnated with the detergent liquor. This liquor produces a degree of alkalinity within the rinse water. A high level of alkalinity is not desired herein as it may provide a soapy feeling on the consumer's hands and fabrics, as well as inducing a carbonate deposition thereby participating to  
20 the source of harshness on the fabrics.

- Accordingly, a pH buffering component is another preferred component for the compositions of the invention. The pH buffering component ensures that the pH of the composition is buffered to a pH value ranging from 3.0 to 7, and preferably  
25 from 4 to 6 after the composition has been diluted into 1 to 10000 times, preferably 1 to 5000, most preferably 300 to 600 its weight of water.

- Suitable pH buffering components for use herein are selected from the group consisting of alkali metal salts of carbonates, preferably sodium bicarbonate,  
30 polycarbonates, sesquicarbonates, silicates, polysilicates, borates, metaborates, phosphates, preferably sodium phosphate such as sodium hydrogenophosphate, polyphosphate like sodium tripolyphosphate, alluminates, and mixtures thereof, and preferably are selected from alkali metal salts of carbonates, phosphates, and mixtures thereof. Optimum buffering system are characterised by good  
35 solubility, even in very hard water conditions (e.g. 30gpg). One less preferred buffering system is sodium tripolyphosphate (STPP) at a high level, i.e. 18% by



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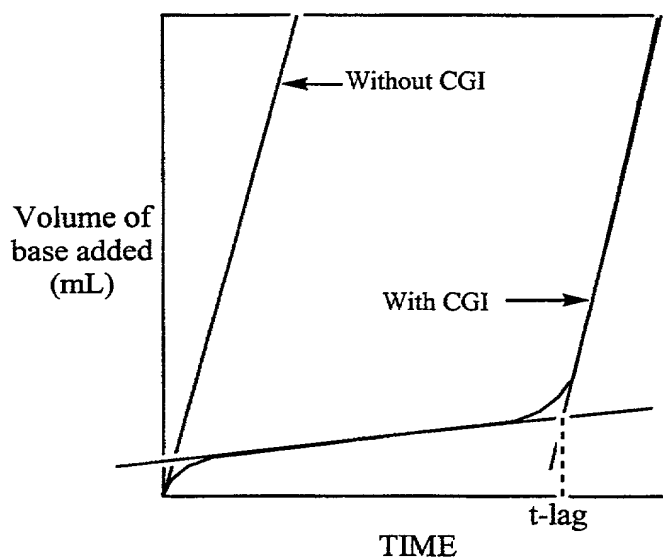
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## 25

The suitability of a material to serve as a crystal growth inhibitor according to the present invention can be determined by evaluating *in vitro* the growth rate of certain inorganic micro-crystals. The procedure of Nancollas et al., described in "Calcium Phosphate Nucleation and Growth in Solution", *Prog. Crystal Growth Charact.*, Vol 3, 77-102, (1980), incorporated herein by reference, is a method which is suitable for evaluating compounds for their crystal growth inhibition. The graph below serves as an example of a plot indicating the time delay (t-lag) in crystal formation afforded by a hypothetical crystal growth inhibitor.



The observed t-lag provides a measure of the compound's efficiency with respect to delaying the growth of calcium phosphate crystal. The greater the t-lag, the more efficient the crystal growth inhibitor.

#### Exemplary Procedure

Combine in a suitable vessel, 2.1M KCl (35 mL), 0.0175M  $\text{CaCl}_2$  (50mL), 0.01M  $\text{KH}_2\text{PO}_4$  (50mL), and de-ionized water (350mL). A standard pH electrode equipped with a Standard Calomel Reference electrode is inserted and the temperature adjusted to 37° C while purging of the solution of oxygen. Once the temperature and pH are stabilized, a solution of the crystal growth inhibitor to be test is then added. A typical inhibitor test concentration is  $1 \times 10^{-6}$  M. The solution is titrated to pH 7.4 with 0.05M KOH. The mixture is then treated with 5 mL's of a hydroxyapatite slurry. The hydroxyapatite slurry can be prepared by digesting Bio-Gel® HTP hydroxyapatite powder (100 g) in 1 L of distilled water the pH of which is adjusted to 2.5 by the addition of sufficient 6N HCl and subsequently heating the solution until all of the hydroxyapatite is dissolved (heating for several days may be necessary). The temperature of the solution is then maintained at about 22° C while the pH is adjusted to 12 by the addition of a solution of 50% aqueous KOH. Once again the solution is heated and the resulting slurry is allowed to settle for two days before the supernatant is removed. 1.5 L of distilled water is added, the solution stirred, then after settling again for 2 days the supernatant is removed. This rinsing procedure is repeated six more time after which the pH of the solution is adjusted to neutrality using 2N HCl. The resulting slurry can be stored at 37°C for eleven months.

Crystal growth inhibitors which are suitable for use in the present invention have a t-lag of at least 10 minutes, preferably at least 20 minutes, more preferably at least 50 minutes, at a concentration of  $1 \times 10^{-6}M$ . Crystal growth inhibitors are differentiated from chelating agents by the fact that crystal growth inhibitors have a low binding affinity of heavy metal ions, i.e., copper. For example, crystal growth inhibitors have an affinity for copper ions in a solution of 0.1 ionic strength when measured at 25° C, of less than 15, preferably less than 12.

The preferred crystal growth inhibitors of the present invention are selected from the group consisting of carboxylic compounds, organic diphosphonic acids, organic monophosphonic acids, and mixtures thereof. The following are non-limiting examples of preferred crystal growth inhibitors.

#### Carboxylic Compounds

Non-limiting examples of carboxylic compounds which serve as crystal growth inhibitors include glycolic acid, phytic acid, polycarboxylic acids, polymers and copolymers of carboxylic acids and polycarboxylic acids, and mixtures thereof. The inhibitors may be in the acid or salt form. Preferably the polycarboxylic acids comprise materials having at least two carboxylic acid radicals which are separated by not more than two carbon atoms (e.g., methylene units). The preferred salt forms include alkali metals; lithium, sodium, and potassium; and alkanolammonium. The polycarboxylates suitable for use in the present invention are further disclosed in U.S. 3,128,287, U.S. 3,635,830, U.S. 4,663,071, U.S. 3,923,679; U.S. 3,835,163; U.S. 4,158,635; U.S. 4,120,874 and U.S. 4,102,903, each of which is included herein by reference.

Further suitable polycarboxylates include ether hydroxypolycarboxylates, polyacrylate polymers, copolymers of maleic anhydride and the ethylene ether or vinyl methyl ethers of acrylic acid. Copolymers of 1,3,5-trihydroxybenzene, 2, 4, 6-trisulphonic acid, and carboxymethyloxysuccinic acid are also useful. Alkali metal salts of polyacetic acids, for example, ethylenediamine tetraacetic acid and nitrilotriacetic acid, and the alkali metal salts of polycarboxylates, for example, mellitic acid, succinic acid, oxydisuccinic acid, polymaleic acid, benzene 1,3,5-tricarboxylic acid, carboxymethyloxysuccinic acid, are suitable for use in the present invention as crystal growth inhibitors.

The polymers and copolymers which are useful as crystal growth inhibitors have a molecular weight which is preferably greater than about 500 daltons to about 100,000 daltons, more preferably to about 50,000 daltons.

5 Examples of commercially available materials for use as crystal growth inhibitors include, polyacrylate polymers Good-Rite® ex BF Goodrich, Acrysol® ex Rohm & Haas, Sokalan® ex BASF, and Norasol® ex Norso Haas. Preferred are the Norasol® polyacrylate polymers, more preferred are Norasol® 410N (MW 10,000) and Norasol® 440N (MW 4000) which is an amino phosphonic acid modified polyacrylate polymer, and also more preferred is the acid form of this modified polymer sold as Norasol® QR 784 (MW 4000) ex Norso-Haas.

10 Polycarboxylate crystal growth inhibitors include citrates, e.g., citric acid and soluble salts thereof (particularly sodium salt), 3,3-dicarboxy-4-oxa-1,6-hexanedioates and related compounds further disclosed in U.S. 4,566,984 incorporated herein by reference, C<sub>5</sub>-C<sub>20</sub> alkyl, C<sub>5</sub>-C<sub>20</sub> alkenyl succinic acid and salts thereof, of which dodecenyl succinate, lauryl succinate, myristyl succinate, palmityl succinate, 2-dodecenylsuccinate, 2-pentadecenyl succinate, are non-  
15 limiting examples. Other suitable polycarboxylates are disclosed in U.S. 4,144,226, U.S. 3,308,067 and U.S. 3,723,322, all of which are incorporated herein by reference.

#### Organic Diphosphonic Acids

25 Organic diphosphonic acid are also suitable for use as crystal growth inhibitors. For the purposes of the present invention the term "organic diphosphonic acid" is defined as "an organo-diphosphonic acid or salt which does not comprise a nitrogen atom". Preferred organic diphosphonic acids include C<sub>1</sub>-C<sub>4</sub> diphosphonic acid, preferably C<sub>2</sub> diphosphonic acid selected from the group consisting of  
30 ethylene diphosphonic acid,  $\alpha$ -hydroxy-2 phenyl ethyl diphosphonic acid, methylene diphosphonic acid, vinylidene-1,1-diphosphonic acid, 1,2-dihydroxyethane-1,1-diphosphonic acid, hydroxy-ethane 1,1 diphosphonic acid, the salts thereof, and mixtures thereof. More preferred is hydroxyethane-1,1-diphosphonic acid (HEDP).

#### Organic Monophosphonic Acids

Still useful herein as crystal growth inhibitor are the organic monophosphonic acid. Organo monophosphonic acid or one of its salts or complexes is also suitable for use herein as a CGI.

- 5 By organo monophosphonic acid it is meant herein an organo monophosphonic acid which does not contain nitrogen as part of its chemical structure. This definition therefore excludes the organo aminophosphonates, which however may be included in compositions of the invention as heavy metal ion sequestrants.

10

The organo monophosphonic acid component may be present in its acid form or in the form of one of its salts or complexes with a suitable counter cation. Preferably any salts/complexes are water soluble, with the alkali metal and alkaline earth metal salts/complexes being especially preferred.

15

A preferred organo monophosphonic acid is 2-phosphonobutane-1,2,4-tricarboxylic acid commercially available from Bayer under the tradename of Bayhibit.

20 Heavy metal ion sequestrants

Heavy metal ion (HMI) sequestrants are useful components herein for optimum whiteness and HMI control. By heavy metal ion sequestrants it is meant components which act to sequester (chelate) heavy metal ions. These components may also have calcium and magnesium chelation capacity, but preferentially they bind heavy metal ions such as iron, manganese and copper. These compounds are even more desired when the water is a tap water of low quality and consequently that which comprises a high level of HMI.

25

Heavy metal ion sequestrants are preferably present at a level of from 0.005% to 20%, more preferably from 0.1% to 10%, most preferably from 0.2% to 5% by weight of the compositions.

30

Heavy metal ion sequestrants, which are acidic in nature, having for example phosphonic acid or carboxylic acid functionalities, may be present either in their acid form or as a complex/salt with a suitable counter cation such as an alkali or alkaline metal ion, ammonium, or substituted ammonium ion, or any mixtures

35

thereof. Preferably any salts/complexes are water soluble. The molar ratio of said counter cation to the heavy metal ion sequestrant is preferably at least 1:1.

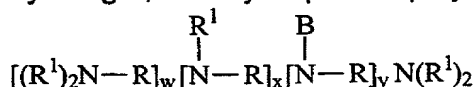
Suitable heavy metal ion sequestrants for use herein include the organo aminophosphonates, such as the amino alkylene poly (alkylene phosphonates) and nitrilo trimethylene phosphonates. Preferred organo aminophosphonates are diethylene triamine penta (methylene phosphonate) and hexamethylene diamine tetra (methylene phosphonate).

Other suitable heavy metal ion sequestrants for use herein include nitrilotriacetic acid and polyaminocarboxylic acids such as ethylenediaminetetracetic acid, ethylenetriamine pentacetic acid, or ethylenediamine disuccinic acid. Especially preferred is ethylenediamine-N,N'-disuccinic acid (EDDS), most preferably present in the form of its S,S isomer, which is preferred for its biodegradability profile.

Still other suitable heavy metal ion sequestrants for use herein are iminodiacetic acid derivatives such as 2-hydroxyethyl diacetic acid or glyceryl imino diacetic acid, described in EPA 317 542 and EPA 399 133.

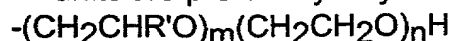
#### Hydrophobic Dispersant

The composition of the invention optionally comprises a hydrophobic dispersant. The hydrophobic dispersant is suitable herein for giving optimised stain removal benefit on clay. Accordingly, a preferred composition of the present invention comprises from about 0.1%, preferably from about 5%, more preferably from about 10% to about 80%, preferably to about 50%, more preferably to about 25% by weight, of a hydrophobic polyamine dispersant having the formula:



wherein R, R<sup>1</sup> and B are suitably described in U.S. 5,565,145 Watson et al., issued October 15, 1996 incorporated herein by reference, and w, x, and y have values which provide for a backbone prior to substitution of preferably at least about 1200 daltons, more preferably 1800 daltons.

R<sup>1</sup> units are preferably alkyleneoxy units having the formula:



wherein R' is methyl or ethyl, m and n are preferably from about 0 to about 50, provided the average value of alkoxylation provided by  $m + n$  is at least about 0.5.

A further description of polyamine dispersants suitable for use in the present invention is found in U.S. 4,891,160; U.S. 4,597,898; EP 111,965; EP 111,984; EP 112,592; U.S. 4,548,744; and U.S. 5,565,145; all of which are included herein by reference. However, any suitable clay/soil dispersant or anti-redeposition agent can be used in the compositions of the present invention.

Commercially available amino-functional polymer suitable for use herein are poly(ethyleneimine) with a MW 1200, hydroxyethylated poly(ethyleneimine) from Polysciences, with a MW 2000, and 80% hydroxyethylated poly(ethyleneimine) from Aldrich.

Preferred polyamines are the poly(ethyleneimine) with a MW 1200, 1800, and ethoxylated with 1, 2, 3, or 7 moles of ethylene oxide.

#### **Stabilising agent**

In the presence of antifoam materials made of silicone, it is preferred to use a component that will provide a good stabilisation of the silicone antifoam and hence of the composition. Typical levels of stabilising agents are of from 0.01% to 20%, preferably from 0.5% to 8%, more preferably from 0.1% to 6% by weight of the composition.

Suitable stabilising agents to be used herein include synthetic and natural occurring polymers. Suitable stabilising agents for used herein include xanthan gum or derivatives thereof, alginate or a derivative thereof, polysaccharide polymers such as substituted cellulose materials like ethoxylated cellulose, carboxymethylcellulose, hydroxymethylcellulose, hydroxypropyl cellulose, hydroxyethyl cellulose and mixtures thereof.

Preferred stabilising agents for use in the compositions of the invention are xanthan gum or derivatives thereof sold by the Kelco Division of Merck under the tradenames KELTROL®, KELZAN AR®, KELZAN D35®, KELZAN S®, KELZAN XZ® and the like.

Polymeric soil release agents are also useful in the present invention as stabilising agents. These include cellulosic derivatives such as hydroxyether cellulosic polymers, ethoxylated cellulose, carboxymethylcellulose, hydroxymethylcellulose, hydroxypropyl cellulose, hydroxyethyl cellulose, and the like. Such agents are commercially available and include hydroxyethers of cellulose such as METHOCEL (Dow). Cellulosic soil release agents for use herein also include those selected from the group consisting of C1-C4 alkyl and C4 hydroxyalkyl cellulose; see U.S. Patent 4,000,093, issued December 28, 1976 to Nicol, et al.

### **PRESERVATIVE**

Optionally, but preferably, antimicrobial preservative can be added to the composition of the present invention, especially if the stabilising agent is made of cellulose. Indeed, the cellulose materials can make a prime breeding ground for certain microorganisms, especially when in aqueous compositions. This drawback can lead to the problem of storage stability of the solutions for any significant length of time. Contamination by certain microorganisms with subsequent microbial growth can result in an unsightly and/or malodorous solution. Because microbial growth in solutions is highly objectionable when it occurs, it is highly preferable to include an antimicrobial preservative, which is effective for inhibiting and/or regulating microbial growth in order to increase storage stability of the composition.

It is preferable to use a broad spectrum preservative, e.g., one that is effective on both bacteria (both gram positive and gram negative) and fungi. A limited spectrum preservative, e.g., one that is only effective on a single group of microorganisms, e.g., fungi, can be used in combination with a broad spectrum preservative or other limited spectrum preservatives with complimentary and/or supplementary activity. A mixture of broad spectrum preservatives can also be used. In some cases where a specific group of microbial contaminants is problematic (such as Gram negatives), aminocarboxylate chelators, such as those described hereinbefore, can be used alone or as potentiators in conjunction with other preservatives. These chelators which include, e.g., ethylenediaminetetraacetic acid (EDTA), hydroxyethylenediaminetriacetic acid,



diethylenetriaminepentaacetic acid, and other aminocarboxylate chelators, and mixtures thereof, and their salts, and mixtures thereof, can increase preservative effectiveness against Gram-negative bacteria, especially *Pseudomonas* species.

5 Antimicrobial preservatives useful in the present invention include biocidal compounds, i.e., substances that kill microorganisms, or biostatic compounds, i.e., substances that inhibit and/or regulate the growth of microorganisms. Well known preservatives such as short chain alkyl esters of p-hydroxybenzoic acid, commonly known as parabens; N-(4-chlorophenyl)-N'-(3,4-dichlorophenyl) urea,  
10 also known as 3,4,4'-trichlorocarbanilide or triclocarban; 2,4,4'-trichloro-2'-hydroxy diphenyl ether, commonly known as triclosan are useful preservative in the present invention.

Still other preferred preservatives are the water-soluble preservatives, i.e. those  
15 that have a solubility in water of at least about 0.3 g per 100 ml of water, i.e., greater than about 0.3% at room temperature, preferably greater than about 0.5% at room temperature.

The preservative in the present invention is included at an effective amount. The  
20 term "effective amount" as herein defined means a level sufficient to prevent spoilage, or prevent growth of inadvertently added microorganisms, for a specific period of time. In other words, the preservative is not being used to kill microorganisms on the surface onto which the composition is deposited in order to eliminate odors produced by microorganisms. Instead, it is preferably being  
25 used to prevent spoilage of the solution in order to increase the shelf-life of the composition. Preferred levels of preservative are from about 0.0001% to about 0.5%, more preferably from about 0.0002% to about 0.2%, most preferably from about 0.0003% to about 0.1%, by weight of the usage composition.

30 The preservative can be any organic preservative material which will not cause damage to fabric appearance, e.g., discoloration, coloration, bleaching. Preferred water-soluble preservatives include organic sulfur compounds, halogenated compounds, cyclic organic nitrogen compounds, low molecular weight aldehydes, quaternary ammonium compounds, dehydroacetic acid, phenyl  
35 and phenolic compounds, and mixtures thereof. Non-limiting examples of preferred water-soluble preservatives for use in the present invention can be

found in U.S. Patent 5,714,137, incorporated hereinbefore by reference, as well as co-pending application PCT/US 98/12154 pages 29 to 36.

Preferred water-soluble preservatives for use in the present invention are organic sulfur compounds. Some non-limiting examples of organic sulfur compounds suitable for use in the present invention are:

(a) **3-Isothiazolone Compounds**

10 A preferred preservative is an antimicrobial, organic preservative containing 3-isothiazolone groups. This class of compounds is disclosed in U.S. Pat. No. 4,265,899, Lewis et al., issued May 5, 1981, and incorporated herein by reference. A preferred preservative is a water-soluble mixture of 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one, more preferably a  
15 mixture of about 77% 5-chloro-2-methyl-4-isothiazolin-3-one and about 23% 2-methyl-4-isothiazolin-3-one, a broad spectrum preservative available as a 1.5% aqueous solution under the trade name Kathon<sup>®</sup> CG by Rohm and Haas Company.

20 When Kathon<sup>®</sup> is used as the preservative in the present invention it is present at a level of from about 0.0001% to about 0.01%, preferably from about 0.0002% to about 0.005%, more preferably from about 0.0003% to about 0.003%, most preferably from about 0.0004% to about 0.002%, by weight of the composition.

25 Other isothiazolins include 1,2-benzisothiazolin-3-one, available under the trade name Proxel<sup>®</sup> products; and 2-methyl-4,5-trimethylene-4-isothiazolin-3-one, available under the trade name Promexal<sup>®</sup>. Both Proxel and Promexal are available from Zeneca. They have stability over a wide pH range (i.e., 4-12). Neither contain active halogen and are not formaldehyde releasing preservatives.  
30 Both Proxel and Promexal are effective against typical Gram negative and positive bacteria, fungi and yeasts when used at a level from about 0.001% to about 0.5%, preferably from about 0.005% to about 0.05%, and most preferably from about 0.01% to about 0.02% by weight of the usage composition.

35 (b) **Sodium Pyrithione**

Another preferred organic sulfur preservative is sodium pyrithione, with water solubility of about 50%. When sodium pyrithione is used as the preservative in the present invention it is typically present at a level of from about 0.0001% to about 0.01%, preferably from about 0.0002% to about 0.005%, more preferably from about 0.0003% to about 0.003%, by weight of the usage composition.

Mixtures of the preferred organic sulfur compounds can also be used as the preservative in the present invention.

### **ANTIMICROBIAL ACTIVE**

The composition of the invention may also comprises antimicrobial actives. These are useful in providing protection against organisms that become attached to the treated material.

Sanitization of fabrics can be achieved by the compositions of the present invention containing, antimicrobial materials, e.g., antibacterial halogenated compounds, quaternary compounds, and phenolic compounds, and preferably quaternary compounds. A typical disclosure of these antimicrobial can be found in co-pending application PCT/US 98/12154 pages 17 to 20.

#### **Quaternary Compounds.**

A wide range of quaternary compounds can also be used as antimicrobial actives, in conjunction with the preferred surfactants, for compositions of the present invention that do not contain cyclodextrin. Non-limiting examples of useful quaternary compounds include: (1) benzalkonium chlorides and/or substituted benzalkonium chlorides such as commercially available Barquat® (available from Lonza), Maquat® (available from Mason), Variquat® (available from Witco/Sherex), and Hyamine® (available from Lonza); (2) di(C<sub>6</sub>-C<sub>14</sub>)alkyl di short chain (C<sub>1-4</sub> alkyl and/or hydroxyalkyl) quaternary such as Bardac® products of Lonza, (3) N-(3-chloroallyl) hexaminium chlorides such as Dovicide® and Dovicil® available from Dow; (4) benzethonium chloride such as Hyamine® 1622 from Rohm & Haas; (5) methylbenzethonium chloride represented by Hyamine® 10X supplied by Rohm & Haas, (6) cetylpyridinium chloride such as Cepacol chloride available from of Merrell Labs. Examples of the preferred dialkyl quaternary compounds are di(C<sub>8</sub>-C<sub>12</sub>)dialkyl dimethyl ammonium chloride, such

as didecyldimethylammonium chloride (Bardac 22), and dioctyldimethylammonium chloride (Bardac 2050). Typical concentrations for biocidal effectiveness of these quaternary compounds range from about 0.001% to about 0.8%, preferably from about 0.005% to about 0.3%, more preferably from about 0.01% to about 0.2%, and even more preferably from about 0.03% to about 0.1%, by weight of the usage composition.

#### Liquid carrier

Another optional, but preferred, ingredient is a liquid carrier. The liquid carrier employed in the instant compositions is preferably at least primarily water due to its low cost, relative availability, safety, and environmental compatibility. The level of water in the liquid carrier is preferably at least about 50%, most preferably at least about 60%, by weight of the carrier. Mixtures of water and low molecular weight, e.g., <about 200, organic solvent, e.g., lower alcohols such as ethanol, propanol, isopropanol or butanol are useful as the carrier liquid. Low molecular weight alcohols include monohydric, dihydric (glycol, etc.) trihydric (glycerol, etc.), and higher polyhydric (polyols) alcohols.

#### Optional

The present invention composition can include optional components conventionally used in textile treatment compositions, for example: brighteners, photoactivated bleaching agents such as the sulfonated zinc and/or aluminum phthalocyanines, perfumes, chlorine scavengers, colorants; surfactants; anti-shrinkage agents; fabric crisping agents; spotting agents; germicides; fungicides; anti-oxidants such as butylated hydroxy toluene, anti-corrosion agents, and mixtures thereof.

#### Form of the composition

The composition of the invention may take a variety of physical form including liquid, liquid-gel, paste-like, foam in either aqueous or non-aqueous form, powder like granular and tablet forms. For better dispersibility, a preferred form of the composition is a liquid form.

When in a liquid form, the composition may also be dispensed by a dispensing means such as a spray dispenser, or aerosol dispenser.

### Spray Dispenser

The present invention also relates to such compositions incorporated into a spray dispenser to create an article of manufacture that can facilitate treatment of fabric articles and/or surfaces with the compositions according to the invention at a level that is effective. The spray dispenser comprises manually activated and non-manual powered (operated) spray means and a container containing the treating composition. Typical disclosure of such spray dispenser can be found in WO 96/04940 page 19 line 21 to page 22 line 27.

### Method of use

#### *Rinse process*

This can be done in a so-called rinse process, where a composition as defined herein, is first diluted in an aqueous bath. Subsequently, the fabric which have been washed with a detergent liquor are contacted with the diluted composition. Of course, the composition may also incorporated into the aqueous bath once the fabrics have been immersed therein. Following that step, the fabrics are rinsed according to the conventional process of agitation whereby the suds collapse, and optionally further rinsing with water. The fabric can then be optionally wringed for drying. Accordingly, there is provided a method for rinsing fabrics, which comprises the steps of contacting fabrics, previously contacted with a detergent liquor, with a composition of the invention.

Alternatively, this rinse process may be performed in a non-automated washing machine, whereby the laundered fabrics are removed from the detergent liquor, wringed while the detergent liquor is removed from the drum and replaced by fresh water. The composition of the invention is added to the water and the fabrics are then rinsed according to the conventional rinsing habit.

#### *Pre-treatment and/or soaking process*

Still in a further aspect of the invention, it has been found that the composition of the invention were also suitable for pre-treatment process and/or soaking processes. In particular, the use of the composition has been found very effective

on collar and socks which conventionally are the items and/or locations which are the most difficult to clean.

This can be done either in a so-called "pretreatment mode", where a composition, as defined herein, is applied neat onto said fabrics before the fabrics are rinsed, or washed then rinsed, or in a "soaking mode" where a composition, as defined herein, is first diluted in an aqueous bath and the fabrics are immersed and soaked in the bath, before they are rinsed. It is also essential in both cases, that the fabrics be rinsed after they have been contacted with said composition, before said composition has completely dried off.

The compositions according to the present invention may be used in neat or diluted form. However the compositions herein are typically used in diluted form in a laundry operation. By "in diluted form", it is meant herein that the compositions for the treating of fabrics according to the present invention may be diluted by the user, preferably with water. Such dilution may occur for instance in hand laundry applications as well as by other means such as in a washing machine, preferably non auto top loaded washing machine. Said compositions can be diluted up to 1 to 10000 times, preferably 1 to 5000, most preferably 300 to 600 times. Typical rinse dilutions are of 500 times (20 ml in 10liters) for a dilution in a basin (hand-rinsing), of 390 for a dilution in a non automatic washing machine (90ml in 35 liters), of 342 for a dilution with a current fabric softener composition in western Europe washing machine (38 ml in 12 liters), and of 555 for a dilution with a current fabric softener composition in western Europe hand rinsing.

More specifically, the process of soaking the fabrics according to the present invention comprises the steps of first contacting said fabrics with a composition according to the present invention, in its diluted form, then allowing said fabrics to remain in contact with said composition, for a period of time sufficient to treat said fabrics, typically 1 minute to 24 hours, preferably 1 to 60 minutes, more preferably 1 to 5 minutes, then complete the rinsing of said fabrics as done usually (agitation, optional rinse, and wringing). If said fabrics are to be washed, i.e., with a conventional detergent composition preferably comprising at least one surface active agent, said washing may be subsequently followed by a rinse step comprising a composition of the invention. Accordingly, said process according to the present invention allows cleaning of fabrics and optionally washing of fabrics

with a detergent composition preferably comprising at least one surface active agent before the optional step of contacting said fabrics with said composition in the rinse step.

- 5 In another embodiment of the present invention the process of pre-treating fabrics comprises the step of contacting fabrics with a composition according to the present invention, in its neat form and allowing said fabrics to remain in contact with said composition for a period of time sufficient to clean said fabrics, typically 5 seconds to 30 minutes, preferably 1 minute to 10 minutes and then rinsing said  
10 fabrics with water. If said fabrics are to be washed, i.e., with a conventional detergent composition comprising at least one surface active agent, said washing may be conducted before or after that said fabrics have been pre-treated. Advantageously, the present invention provides compositions that may be applied neat onto a fabric; the present compositions being safe to colors and fabrics per  
15 se.

Alternatively instead of following the neat bleaching method as described herein above (pretreater application) by a rinsing step with water and/or a conventional washing step with a liquid or powder conventional detergent, the pre-treatment  
20 operation may also be followed by the diluted washing process as described herein before either in bucket (hand operation) or in a washing machine.

For the purposes of the present invention the term "contacting" is defined as "intimate contact of a fabric with an aqueous solution of the hereinabove  
25 described composition which comprises a suds suppressing system." Contacting typically occurs by soaking, washing, rinsing, spraying the composition onto fabric, but can also include contact of a substrate *inter alia* a material onto which the composition has been absorbed, with the fabric. Hand treatment is a preferred process. Temperatures for treatment can take place at a variety of  
30 temperatures, however, treatment typically occurs at a temperature less than about 30° C, preferably from about 5° C to about 25° C.

The invention is illustrated in the following non limiting examples, in which all percentages are on a weight basis unless otherwise stated.

In the examples, the abbreviated component identifications have the following meanings:

5	Suds Sup 35 Corning	:	Silicone 3565 commercially available from Dow
	Suds Sup 23:		Silicone 2-3000 commercially available from Dow Corning
	Suds Sup Iso:		2-Butyloctanol commercially available under the tradename ISOFOL12 from Condea
10	Gum A:		CarboMethoxyCellulose commercially available from Fluka
	Gum B	:	Xanthan Gum commercially available from Aldrich
	Antibacterial	:	Triclosan commercially available from Aldrich
	Acidifying A	:	Citric Acid
15	Acidifying B	:	Maleic Acid
	Buffering A	:	Sodium Hydrogenophosphate
	Buffering B	:	Sodium tripolyphosphate
	Chelant	:	Diethyleneaminepentamethylphosphonic acid
	Ca Inhibitor.	:	Hydroxyethyldiphosphonic acid
20	Polymer:		Polyethylene imine ethoxylated with 7 moles of ethylene oxide(MW 1800, at 50% active)
	Photobleach	:	Zinc phthalocyanine



## Examples

The following fabric hand treatment compositions are in accordance with the present invention.

5

[illegible][illegible][illegible]

	Y	Z	AA	BA	CA	DA	EA	FA
Suds Sup 35	0.5	0.1	-	-	0.5	0.1	-	-
Suds Sup 23	-	-	1.5	1.5	-	-	1.5	1.5
Gum A	-	-	5	-	-	-	5	-
Gum B	0.5	0.1	-	0.5	0.5	0.1	-	0.5
Acidifying B	5	1	5	5	5	1	5	5
Buffering A	2.5	0.5	2.5	2.5	-	-	-	-
Buffering B	-	-	-	-	2.5	0.5	2.5	2.5
Perfume	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minors/water	to balance to 100%							

	GA	HA	IA	KA	LA	MA	NA	OA
Suds Sup 35	0.5	0.1	-	-	0.5	0.1	-	-
Suds Sup 23	-	-	1.5	1.5	-	-	1.5	1.5
Gum A	-	-	5	-	-	-	5	-
Gum B	0.5	0.1	-	0.5	0.5	0.1	-	0.5
Antibacterial	-	-	-	-	1	1	1	1
Acidifying B	5	1	5	5	5	1	5	5
Buffering B	2.5	0.5	2.5	2.5	2.5	0.5	2.5	2.5
Chelant	1	1	1	1	1	1	1	1
Ca Inhibitor	1	1	1	1	1	1	1	1
Polymer	1	-	1	-	1	-	1	-
Photobleach	0.001	-	-	0.001	0.001	-	-	0.001
Perfume	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minors/water	to balance to 100%							

What is claimed is:

1-A fabric treatment composition comprising a suds suppressing system, characterised in that the composition has a clarity value upon a 0.2% dilution of less than a 0.04% by weight of a dimethyl bis(steroyl oxyethyl) ammonium chloride aqueous solution and a suds reduction value of at least 50%.

2-A composition according to Claim 1, wherein the composition has an acidic pH.

3-A composition according to either one of Claim 1 or 2, wherein the suds suppressing system is selected from silicone antifoam compounds, alcohol antifoam compounds, fatty acids, and paraffin antifoam compounds, poloxamer, polypropyleneglycol, dimethicone, tallow derivatives, light petroleum odorless hydrocarbons, fatty esters, fatty acid esters of monovalent alcohols, aliphatic C<sub>18</sub>-C<sub>40</sub> ketones, N-alkylated amino triazines, bis stearic acid amide, monostearyl phosphates, phosphate esters, quaternary ammonium compounds, di-alkyl quaternary compounds, poly functionalised quaternary compounds, and nonionic polyhydroxyl derivatives, and mixtures thereof, preferably are selected from silicone antifoam compounds.

4-A composition according to any one of Claims 1-3, wherein the composition further comprises a stabilising agent, preferably selected from xanthan gum or derivatives thereof, alginate or a derivative thereof, polysaccharide polymers such as substituted cellulose materials like ethoxylated cellulose, carboxymethylcellulose, hydroxymethylcellulose, hydroxypropyl cellulose, hydroxyethyl cellulose and mixtures thereof.

5-A composition according to any one of Claims 1-4, wherein the composition further comprises an antibacterial.

6-A composition according to any one of Claim 1-5, wherein the composition further comprises a buffering system, preferably selected from the group consisting of alkali metal salts of carbonates, polycarbonates, sesquicarbonates, silicates, polysilicates, borates, metaborates, phosphates, polyphosphate, alluminates, and mixtures thereof, and more preferably are selected from alkali metal salts of carbonates, phosphates, and mixtures thereof.

7-A composition according to any one of Claims 1-6, wherein the composition further comprises a crystal growth inhibitor, preferably selected from carboxylic compounds, organic diphosphonic acids, organic monophosphonic acids, and mixtures thereof.

8-A composition according to any one of Claims 1-7, wherein the composition further comprises a heavy metal ion sequestrant, preferably selected from organo aminophosphonates, nitrilotriacetic acid, polyaminocarboxylic, iminodiacetic acid, and mixtures thereof.

9-A composition according to any one of Claims 1-8, wherein the composition further comprises a hydrophobic dispersant.

10-A method of rinsing fabrics which comprises the steps of contacting the fabrics, previously contacted with an aqueous detergent liquor, with a composition as defined in any one of Claims 1-9.

11-A method of pre-treating fabrics which comprises the steps of contacting fabrics with a composition as defined in any one of Claim 1-9, in its neat form, before the fabrics are rinsed or washed and rinsed.

12-A method of soaking fabrics which comprises the steps of contacting said fabrics with a composition as defined in any one of Claim 1-9, in its diluted form, before the fabrics are rinsed or washed and rinsed.

13-A method according to any one of Claims 10-12, wherein the method is made by hand.

14-A method according to Claim 10, wherein the composition is used with the first rinse.

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(54) Title: **TREATMENT COMPOSITIONS FOR FABRICS**

(57) Abstract: There is provided a composition for the hand treatment fabric, such as pre-treatment, soaking, and/or rinsing, whereby the composition comprises a suds suppressing system and has a clarity value upon a 0.2 % dilution of less than a 0.04 % by weight of a dimethyl bis(steroyl oxyethyl) ammonium chloride aqueous solution and a suds reduction value of at least 50 %.

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## DECLARATION COMBINED WITH POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

"Treatment Compositions For Fabrics"

bearing the above listed Procter & Gamble Company Case number, the specification of which was filed as PCT/US00/25685, designating at least the United States of America, with the United States Receiving Office on 20 September 2000.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37 Code of Federal Regulations §1.56.

I hereby claim foreign priority benefits under Title 35 United States Code §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application for patent or Inventor's certificate having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S) TO WHICH WE CLAIM PRIORITY:

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20 September 1999

I hereby claim the benefit under Title 35 United States Code §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35 United States Code §112, I acknowledge the duty to disclose material information as defined in Title 37 Code of Federal Regulations §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Appln. Serial No.)	(Filing Date)	(Status)(patented, pending, abandoned)
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I hereby appoint the following as my attorney(s) or agent(s) with full power of substitution to prosecute this application and transact all business in the Patent and Trademark office connected therewith:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willfull false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such will ful false statements may jeopardize the validity of the application or any patent issued thereon.

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